Jeffrey H. Blum
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March 19, 2014

EX PARTE PRESENTATION

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Ex Parte Presentation in GN Docket No. 13-185, *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*

Dear Ms. Dortch:

Pursuant to Section 1.1206 of the Commission's rules, 47 C.F.R. § 1.1206, DISH Network Corporation ("DISH") submits this letter summarizing the following meetings:

- A meeting on Tuesday March 18, 2014 with David Goldman, Senior Legal Advisor to Commissioner Rosenworcel. Present on behalf of DISH were Jeffrey Blum, Senior Vice President and Deputy General Counsel and Alison Minea, Director and Senior Counsel.
- A meeting on Tuesday March 18, 2014 with Erin McGrath, Legal Advisor for Wireless, Public Safety, and International for Commissioner O'Rielly. Present on behalf of DISH were Jeffrey Blum, Senior Vice President and Deputy General Counsel and Alison Minea, Director and Senior Counsel.
- A meeting on Tuesday March 18, 2014 with Louis Peraertz, Legal Advisor for Wireless, International, and Public Safety for Commissioner Clyburn and Stefanie Frank, Law Clerk. Present on behalf of DISH were Jeffrey Blum, Senior Vice President and Deputy General Counsel and Alison Minea, Director and Senior Counsel.
- A telephone call on Tuesday March 18, 2014 with Janet Young, Broadband Division, Wireless Telecommunications Bureau; Chris Helzer, Broadband Division, Wireless Telecommunications Bureau; and Tom Tran, Spectrum and Competition Policy Division, Wireless Telecommunications Bureau. Mariam Sorond, Vice President of Technology Development, participated in the call for DISH.

The discussion was consistent with the *ex parte* presentations DISH made on March 7 and March 14, 2014, both attached.[1] During the meetings, DISH also noted that its AWS 1/3/4 interoperability proposal is for the 2180-2200 MHz portion of the spectrum and not the 2000-2020 MHz portion, and that it is solely for devices, not base stations. DISH also notes that AWS 1/3/4 downlink interoperability would *not* be impacted by the flexibility that DISH was granted in December 2013 to choose to use the lower AWS-4 band (2000-2020 MHz) as downlink.[2] The upper AWS-4 spectrum at 2180-2200 MHz is designated for downlink today, and will continue to be downlink regardless of the election DISH makes with respect to 2000-2020 MHz.

DISH also noted that there has been no band class underway at the 3rd Generation Partnership Project ("3GPP") that would encompass the AWS-1 plus AWS-3 downlink bands at 2110 to 2180 MHz. 3GPP will have to begin work from square one to develop a new band plan regardless of whether the FCC adopts DISH's proposal.

DISH also provides additional support for its argument that extending interoperability across the AWS 1, 3, and 4 downlink bands results in a reasonable and supportable bandwidth size. As noted previously, the proposed 90 MHz filter bandwidth is 4.18% of the band's center frequency at 2155 MHz, which is in line with typical filter design recommendations.[3] There are at least two instances of other 3GPP bands in which the filter bandwidth ratio exceeds 4.18 %:

3GPP Band	Uplink Bandwidth	Uplink Center Frequency	Uplink Ratio	Downlink Bandwidth	Downlink Center Frequency	Downlink Ratio
Band 3 (FDD)	75 MHz	1747.5 MHz	4.29 %	75 MHz	1842.5 MHz	4.07 %
Band 26 (FDD)	35 MHz	831.5 MHz	4.21 %	35 MHz	876.5 MHz	3.99 %

DISH also provides additional support for why carrier aggregation of two immediately adjacent bands, such as the AWS-3 and AWS-4 downlinks, without a single filter is a challenge. A presentation at The International Wireless Industry Consortium ("IWPC") outlines the characteristics of a multiplexer which is used for carrier aggregation.[4] A multiplexer is an array of filters adjusted to not load each other as they share a common antenna terminal. Multiplexing two immediately adjacent bands, which have similar matching characteristics, will be challenging without the filters loading each other. The resulting multiplexer will therefore exhibit a very high insertion loss penalty.

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[1] *See* Letter from Jeffrey H. Blum, DISH, to Marlene H. Dortch, FCC, GN Docket No. 13-185 (Mar. 7, 2014) ("DISH March 7 Ex Parte"), attached as Attachment A; Letter from Jeffrey H. Blum, DISH, to Marlene H. Dortch, FCC, GN Docket No. 13-185 (Mar. 14, 2014) ("DISH March 14 Ex Parte"), attached as Attachment B.

[2] *See* DISH Network Corporation Petition for Waiver of Sections 27.5(j) and 27.53(h)(2)(ii) of the Commission's Rules and Request for Extension of Time, *Memorandum Opinion and Order*, WT Docket No. 13-225, DA 13-2409 (Dec. 20, 2013).

[3] *See* DISH March 14 Ex Parte at 3.

[4] "Multiplexers For Engineers," Avago Presentation at the IWPC, June 17-19, 2013.

Respectfully submitted,

/s/ Jeffrey H. Blum
Jeffrey H. Blum

cc: Louis Peraertz
Stefanie Frank
David Goldman
Erin McGrath
Janet Young
Chris Helzer
Tom Tran

Attachments

ATTACHMENT A

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March 07, 2014

EX PARTE PRESENTATION

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Ex Parte Presentation in GN Docket No. 13-185, *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*

Dear Ms. Dortch:

Pursuant to Section 1.1206 of the Commission's rules, 47 C.F.R. § 1.1206, DISH Network Corporation ("DISH") submits this letter summarizing a meeting on Wednesday March 5, 2014 with John Leibovitz, Special Advisor to Chairman Wheeler for Spectrum Policy and Deputy Chief, Wireless Telecommunications Bureau; Blaise Scinto, Chief, Broadband Division, Wireless Telecommunications Bureau; Peter Daronco, Deputy Chief, Broadband Division, Wireless Telecommunications Bureau; Brian Regan, Legal Advisor, Wireless Telecommunications Bureau; Janet Young, Engineer, Broadband Division, Wireless Telecommunications Bureau; Genevieve Augustin, Attorney, Broadband Divison, Wireless Telecommunications Bureau; and Nancy Zaczek, Attorney, Broadband Division, Wireless Telecommunications Bureau. Present on behalf of DISH were Jeffrey Blum, Senior Vice President and Deputy General Counsel; Mariam Sorond, Vice President, Technology Development; Alison Minea, Director and Senior Counsel; and Hadass Kogan, Associate Corporate Counsel.

The discussion was consistent with the attached presentation.

Respectfully submitted,

/s/ Jeffrey H. Blum
Jeffrey H. Blum

cc: John Leibovitz
Blaise Scinto
Peter Daronco
Brian Regan
Janet Young
Genevieve Augustin
Nancy Zaczek

Attachment

DISH AWS-3 Proposals

OVERVIEW

- 1695-1710 MHz Band
- Lower J Block (2020-2025 MHz)
- Pair spectrum at 1755-1780 MHz with 2155-2180 MHz
- AWS-1/3/4 Interoperability

1695-1710 MHz Band

- Auction as single, unpaired 15 MHz band.
- License size no smaller than Economic Areas (EAs).
- Standard OOBE (-13 dBm/MHz) and 3GPP device power level (25 dBm EIRP).
- No need to adopt proposed 20 dBm EIRP, which will increase device and deployment costs.
  - Technical solutions can adequately safeguard the Protection Zones without device power limit.
- In lieu of coordination with NTIA, the licensee should have the option of paying for the relocation of the affected government sites in the top 100 Markets.

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Lower J Block (2020-2025 MHz)

- Auction 2020-2025 MHz as an unpaired band in a 5 MHz block.
- EA license sizes.
- Uplink/downlink designation of the band should be tied to DISH's election of the lower AWS-4 band (2000-2020 MHz).
  - If DISH elects downlink for the 2000-2020 MHz band by 6/20/2016, the J Block is designated as downlink. Standard OOBE (-13 dBm/MHz) and base station power (1640 W/MHz for non-rural and 3280 W/MHz for rural).
  - If DISH elects uplink for the 2000-2020 MHz band by 6/20/2016, J Block is designated as uplink. Standard OOBE (-13 dBm/MHz) and 2 W device power limit.
- If downlink is elected, J Block will be subject to the same BAS/government band (2020-2110 MHz) protection rules applied to the lower AWS-4 band (2000-2020 MHz) as downlink.

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1755-1780 MHz and 2155-2180 MHz Bands

- Pair 1755-1780 MHz (uplink) with 2155-2180 MHz (downlink) for auction.
- All 5x5 MHz blocks:
  - 1755-1760 paired with 2155-2160 (5x5) (CMAs)
  - 1760-1765 paired with 2160-2165 (5x5) (CMAs)
  - 1765-1770 paired with 2165-2170 (5x5) (EAs)
  - 1770-1775 paired with 2170-2175 (5x5) (EAs)
  - 1775-1780 paired with 2175-2180 (5x5) (EAs)
- Standard OOBE (-13 dBm/MHz) and 3GPP device power level (25 dBm EIRP) for uplink.
- Standard OOBE (-13 dBm/MHz) and power (1640 W/MHz for non-rural and 3280 W/MHz for rural) for downlink.
- 1755-1780 MHz DoD transition/coordination plan and timeline need to be clarified.

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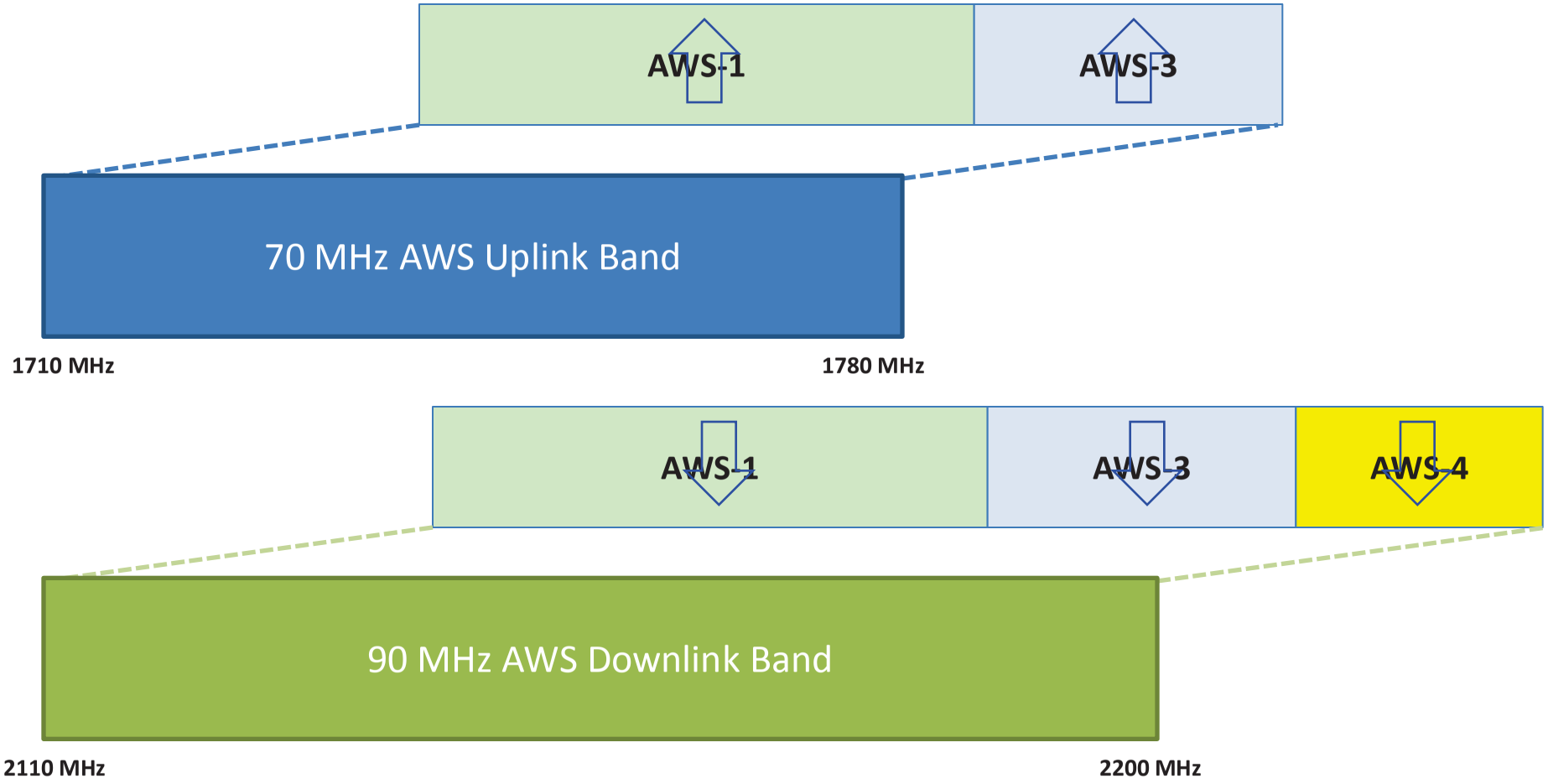
Proposed AWS-1/3/4 Interoperability



ATTACHMENT B

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March 14, 2014

EX PARTE PRESENTATION

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

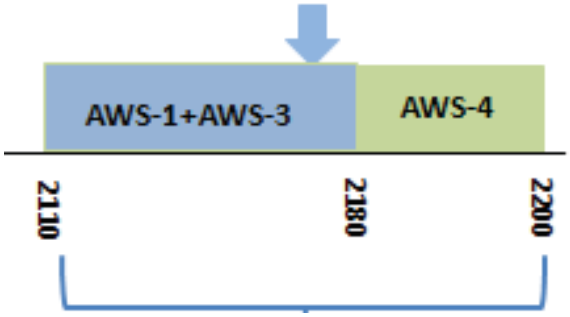
Re: Ex Parte Presentation in GN Docket No. 13-185, *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*

Dear Ms. Dortch:

Following on its March 7, 2014 *ex parte* in the above-referenced docket, DISH Network Corporation ("DISH") provides additional support for its AWS-3 interoperability proposal.

I. Introduction

DISH proposes that the forthcoming AWS-3 Report and Order adopt an interoperability requirement for the downlink band for 2110 MHz to 2200 MHz.[1] Such a requirement (illustrated below) would, among other things, promote the efficient use of spectrum and "the availability of higher quality and lower priced offerings and enhanced choices for customers,"[2] and would substantially increase funding certainty for FirstNet by making the AWS-3 auction much more competitive. It would, in short, be a win for competition, consumers and public safety.



[1] *See* Letter from Jeffrey H. Blum, DISH Network Corporation, to Marlene H. Dortch, FCC, GN Docket No. 13-185, at Attachment (March 7, 2014).

[2] *See* Promoting Interoperability in the 700 MHz Commercial Spectrum, *Report and Order and Order of Proposed Modification*, WT Docket No. 12-69, FCC 13-136, at ¶ 49 (rel. Oct. 29, 2013) ("*700 MHz Interoperability Order*").

The record already reflects broad support for interoperability across the AWS-1 and AWS-3 bands (downlink at 2155-2180 MHz, uplink at 1755-1780 MHz) for new networks.[3] Given the rapidly increasing consumer demand for high-bandwidth, high-speed data consumption, wider swaths of contiguous downlink spectrum or the ability to aggregate across carriers are desirable. For this reason, existing carriers, particularly those with existing AWS-1 licenses, view the upcoming auction of AWS-3 spectrum as a key opportunity to add capacity to their networks. These benefits would be enhanced by extending the requirement to include 2180-2200 MHz (the upper AWS-4 band) as supplemental downlink to create a fully interoperable 90 MHz downlink band.[4]

DISH has a nationwide footprint at 2180-2200 MHz, which is the foundation of its plans to launch a competitive mobile broadband network. But an important step to DISH's success in offering a viable consumer offering is getting its licensed spectrum bands into the mobile devices that consumers use. A regulatory requirement that 2180-2200 MHz be a part a 90 MHz downlink ecosystem helps ensure that the AWS-4 band can be utilized fully and efficiently in the mobile broadband market.

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[3] *See* Letter from George Y. Wheeler, Peter M. Connolly, and Leighton T. Brown, United States Cellular Corporation, to Marlene H. Dortch, FCC, GN Docket No. 13-185, at 3 (February 27, 2014) (Asking the Commission to require that "(1) all AWS-3 mobile devices be capable of transmitting across the entire 1710-1780 MHz uplink band and receiving across the entire 2110- 2180 MHz downlink band; and (2) all AWS-3 networks support and permit the use of such mobile devices."); Reply Comments of T-Mobile USA, Inc., GN Docket No. 13-185, at 21 (October 28, 2013) ("[T]he Commission should consider an interoperability mandate at least for the 1755-1780 MHz band…"). *See also* Letter from C. Sean Spivey, Competitive Carriers Association, to Marlene H. Dortch, FCC, GN Docket No. 13-185, at 3 (March 6, 2014) ("CCA urged the Commission to adopt an interoperability requirement for the AWS-3 band."); Reply Comments of the Rural Wireless Association, GN Docket No. 13-185, at 7-8 (filed October 28, 2013) ("[I]t is imperative that the Commission adopt rules requiring interoperability in the AWS-3 band in order to increase deployment of wireless broadband services to rural America. Mandating interoperability across the AWS-3 band will avoid a repeat of the problems small wireless carriers have experienced with obtaining devices that work in the Lower 700 MHz band, which has left them unable to effectively compete against large carriers in their markets and has significantly delayed deployment of services. Not requiring a fully interoperable AWS-3 device ecosystem could result in a repeat of the delayed roll-out of the Lower 700 MHz band."); Letter from Tamara Preiss, Verizon, to Marlene H. Dortch, FCC, GN Docket No. 13-185, at 2 (February 3, 2014) (Asking the FCC to "adopt technical rules for the AWS-3 spectrum that are consistent with the rules for the AWS-1 band, including a mobile uplink power limit of +23 dBm EIRP, which will facilitate use of the AWS-3 spectrum and interoperability across AWS bands. We noted the opportunity for industry to promote handset interoperability through the development of a single band class that would cover AWS-1 and paired spectrum at 1755-1780 MHz and 2155-2180 MHz.").

[4] DISH also supports the interoperability request across 1710-1780 MHz (existing AWS-1 uplink added to new AWS-3 uplink) advanced by other carriers. DISH, however, is not seeking an interoperability mandate between the AWS-1/3 uplink with 1695-1710 MHz.

Significantly, DISH's interest in bidding in the auction would be *greatly* enhanced by the certainty of interoperability. This is because without an interoperability requirement (which includes 2180-2200 MHz), the AWS-4 downlink could not be carrier-aggregated with the AWS-3 band. Carrier aggregation is not feasible for two immediately adjacent 3GPP bands, which use separate filters. Such carrier aggregation configurations are only feasible with a single 90 MHz filter, which requires an interoperability requirement across the downlinks of AWS-1, AWS-3, and AWS-4. If, however, the FCC extends AWS-3 interoperability to include 2180-2200 MHz, DISH has a compelling reason to win licenses in 2155-2180 MHz.

II. A 90 MHz AWS Downlink Band Is Technically Sound and Creates No Additional Burdens on Current and Future AWS Licensees

DISH's interoperability proposal is technically sound, and will not diminish the value or utility of 2110 to 2180 MHz. Extending interoperability across the AWS downlink bandwidth to include 2155-2180 MHz and 2180-2200 MHz results in a bandwidth size of 90 MHz. Supportable filter bandwidth depends on frequency of operation. The proposed 90 MHz filter bandwidth is 4.18% of the band's center frequency at 2155 MHz. This ratio is in line with typical filter design recommendations.[5] This means a device could support the AWS-1, AWS-3, and AWS-4 downlink bands with a single filter, a critical component enabling device interoperability. The proposed 90 MHz AWS downlink also allows AWS-1 and AWS-3 blocks to augment their downlink capacities by aggregating with the 2180-2200 MHz band as supplemental downlink. Such downlink capacity augmentations would be achieved via standard 3GPP intra-band carrier aggregation.

Extending the interoperability requirement for the upper AWS-4 band to be a part of the larger AWS ecosystem is also beneficial from a cost standpoint for all other ecosystem participants. By ensuring that the upper AWS-4 band is included within any new AWS downlink ecosystem, there will be increases in economies of scale and lower costs for all AWS operators. And, if 2180-2200 MHz is supported in future AWS devices, other AWS operators will be able to enter into roaming, leasing, or partnership agreements with DISH and leverage the additional downlink capacity.

There is, moreover, no burden to any winners of AWS-3 spectrum to adopt DISH's proposal, because a new 3GPP band plan will be needed anyway in order to include the newly auctioned frequencies. The current 3GPP Band 10 downlink specification extends from 2110-2170 MHz. Regardless of whether the next band plan is for 2110-2180 MHz or for 2110-2200 MHz, the impacted stakeholders will need to begin work from *square one* to develop a new band plan at 3GPP. Importantly, DISH is not seeking a backward-looking mandate that would require legacy AWS-1 devices to operate on AWS-4. Instead, AWS-4 would be required to be included with any new 3GPP band plan(s) developed to include AWS-1 and AWS-3 for the future.

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[5] *See* International Wireless Industry Consortium, IWPC Mobile RF Filter Group, *available at* http://apps.fcc.gov/ecfs/document/view;jsessionid=0J4jQ2TKvhG0HdMlkHQncJLv15qQwHmQbzJ1JBt2kQh9CsHvF4pr!-56284754!-224088840?id=7022066310.

III. AWS-3 Downlink Interoperability Would Serve the Public Interest and Be Consistent with Commission Precedent

As the Commission previously found, interoperability among mobile broadband spectrum bands is good for consumers and competition, such as in last year's Lower 700 MHz Band interoperability decision. There, the Commission correctly found that ensuring that devices could operate across the entire Lower 700 MHz Band would "promote the efficient use of spectrum, the availability of higher quality and lower priced offerings and enhanced choices for customers of all wireless broadband providers, overall timely deployment of nationwide wireless broadband coverage, and the delivery of such service to rural and underserved areas."[6] The same benefits apply to DISH's proposal for AWS-3.

Unfortunately, the interoperability mandate was applied to the Lower 700 MHz Band after-the-fact, only when the Commission came to understand that failing to mandate interoperability in the original technical rules caused a situation in which the "existence of two incompatible band classes [presented] a substantial obstacle to the ability of subscribers to switch their service provider to take advantage of higher quality or lower cost service."[7]

In the AWS-3 proceeding, we should learn the lessons of the past. The Commission should set the right rules *at the outset* before carriers and new entrants begin network planning and deployment of AWS-3 spectrum (which likely will coincide with DISH's own buildout of AWS-4). Thus, to achieve the substantial benefits described above, DISH urges the Commission to establish interoperability that spans 2110 to 2200 MHz in the forthcoming AWS-3 Report and Order.

Respectfully submitted,

/s/ Jeffrey H. Blum
Jeffrey H. Blum

[6] *See 700 MHz Interoperability Order* ¶ 49.

[7] *Id.* ¶ 50.